Project Planning: Automated Resume Ranking and Role Matching System

1. Objective

The objective of this project is to design and implement an **Automated Resume Ranking and Role Matching System** that leverages **Natural Language Processing (NLP)** and **Machine Learning (ML)** techniques to efficiently rank and match candidate resumes with job descriptions.
The system aims to:

- Reduce manual screening time for recruiters.
- Increase the accuracy and fairness of candidate-job matches.
- Provide interpretable results for better hiring decisions.

Scope

The Automated Resume Ranking and Role Matching System is a web-based platform that leverages AI and NLP to automate the screening of candidate resumes and match them with job descriptions.

Key capabilities include:

• Resume upload (PDF/DOCX formats).

• AI-based extraction of candidate skills, education, and experience.

• Semantic comparison between job requirements and candidate profiles.

• Ranked display of candidate-job matches via an interactive, user-friendly interface.

Software Requirements specification for Design of Automated Resume Ranking and Role Matching System

The product aims to:

• Reduce manual workload for recruiters.

• Improve accuracy and fairness by minimizing human bias.

• Enhance scalability in handling large applicant volumes.

• Accelerate recruitment by automating initial shortlisting.

Risks and Mitigation

Risk Description	Impact	Likelihood	Mitigation Strategy
Inaccurate resume parsing for non-standard formats	High	Medium	Use hybrid rule-based + ML extraction and perform quality checks
Data privacy concerns during resume collection	High	Low	Anonymize all PII and follow data handling policies
Limited labeled data for model training	Medium	High	Use transfer learning and synthetic labeling

Risk Description	Impact	Likelihood	Mitigation Strategy
Model bias toward certain keywords	Medium	Medium	Include diverse data and monitor fairness metrics
Performance issues for large datasets	High	Medium	Use efficient embeddings and caching
Tight deadlines for final deployment	Medium	Medium	Use Agile sprint planning and frequent check-ins

1.4 Stakeholder Management

Effective stakeholder management ensures smooth coordination and communication throughout the project lifecycle.
The key stakeholders and their responsibilities are summarized below:

Table 1 Stakeholder Management

Stakeholder	Role/Designation	Organization / Domain
Project Members / Student Team	Developers / Researchers	Department of Computer Science and Engineering, Amity University
Academic Supervisor / Project Guide	Faculty Mentor	Department of Computer Science and Engineering, Amity University
Evaluation Committee / Examiners	Academic Reviewers	University Evaluation Board
Institution / Department	Administrative and Academic Authority	Amity School of Engineering and Technology (ASET)
End Users (Recruiters / HR Professionals)	Primary Users	Recruitment and Hiring Sector

Stakeholder communication will occur weekly through progress reports and milestone reviews, ensuring transparency and alignment with academic objectives.

Work Breakdown Structure (WBS)

The Work Breakdown Structure (WBS) of the Automated Resume Ranking and Role Matching System divides the project into five main phases — Requirement Analysis, System Design, Implementation, Testing, and Documentation. In the Requirement Analysis phase, project objectives, data sources, and ranking parameters are defined. System Design focuses on creating the architecture, data flow, and integration plan for the Gemini API. Implementation involves developing the frontend (React), backend (Flask), and connecting the AI module for resume analysis. Testing ensures accuracy, performance, and proper communication between modules through unit and integration testing. Documentation records all procedures, diagrams, and user instructions for clarity and maintenance. Each phase is logically connected to ensure systematic progress and controlled development. The WBS ensures efficient time management, task delegation, and quality assurance. It provides

a clear roadmap for project execution from planning to deployment. Overall, it enhances project monitoring, accountability, and structured development.

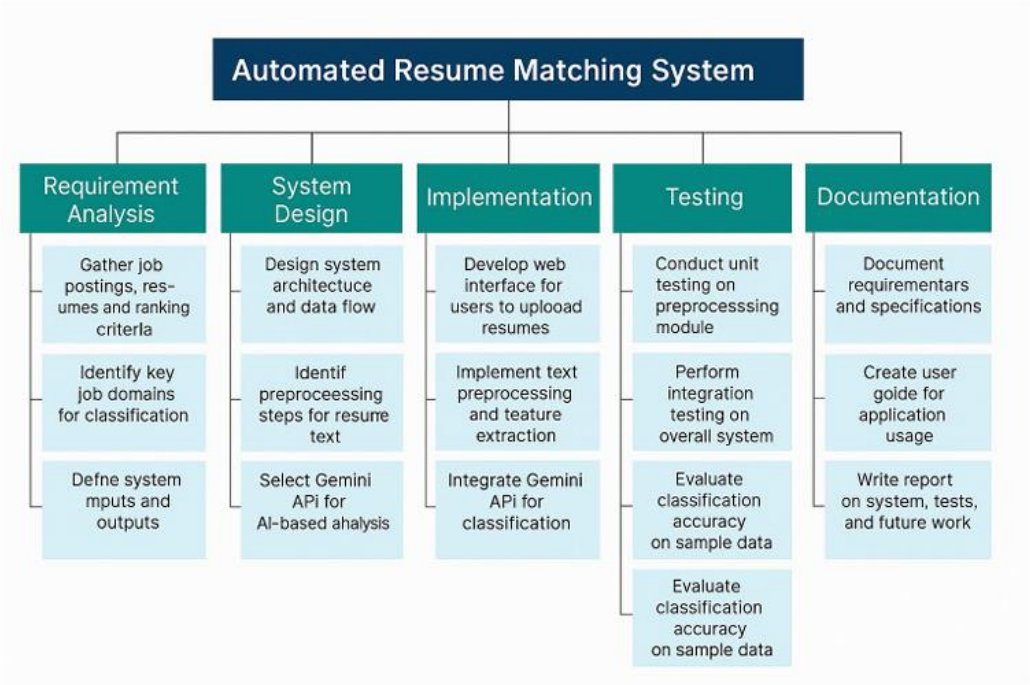

Figure 2: Work Breakdown Structure (WBS) for Design of Automated Ranking and Role Matching System

Critical Path Method (CPM)

The Critical Path Method (CPM) is a project management tool used to identify the longest sequence of dependent activities that determine the minimum project completion time. For the Automated Resume Ranking and Role Matching System, the CPM chart represents the logical flow of major development stages from data collection to testing and deployment.

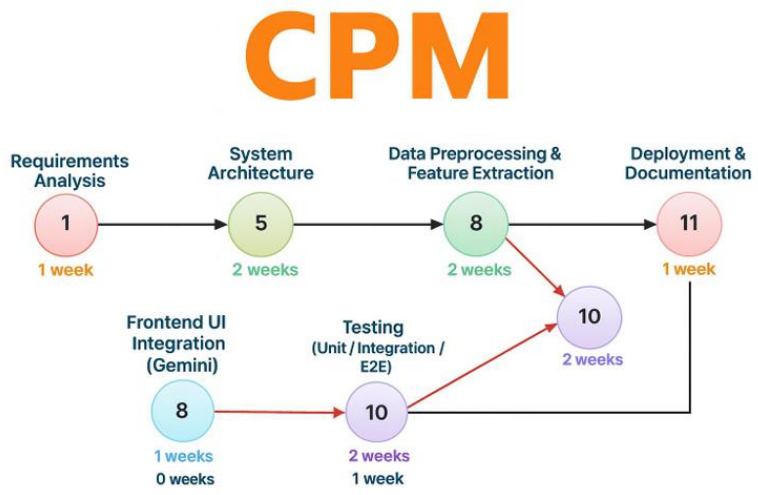

Figure 3 Critical Path